



Hurricane Season Basic Information

National Weather Service

Tallahassee Forecast Area



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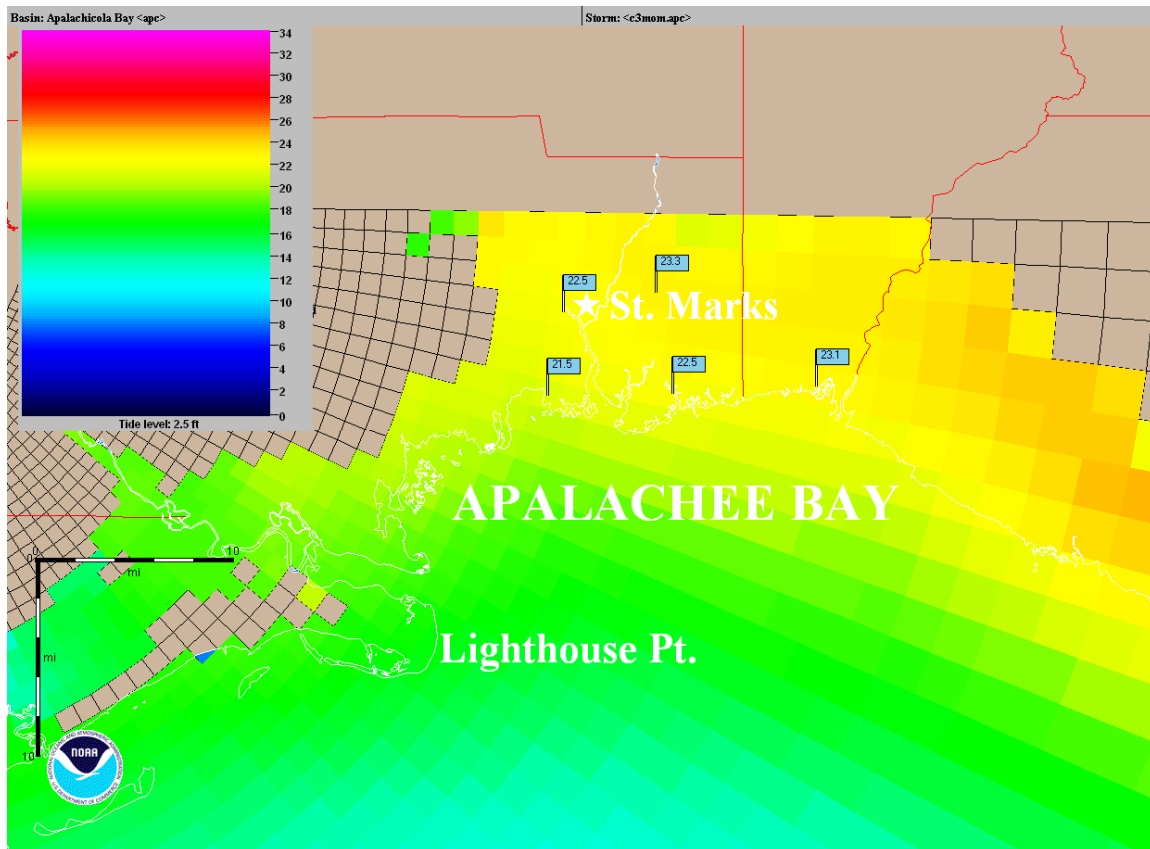
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The information packet contains information on storm surge vulnerabilities, past tropical cyclone data, and one of the hurricane reconnaissance planes. This is a more concise version of a report supplied at the Hurricane Hunter Tour in Apalachicola this past April.

1. Storm Surge Prone Areas

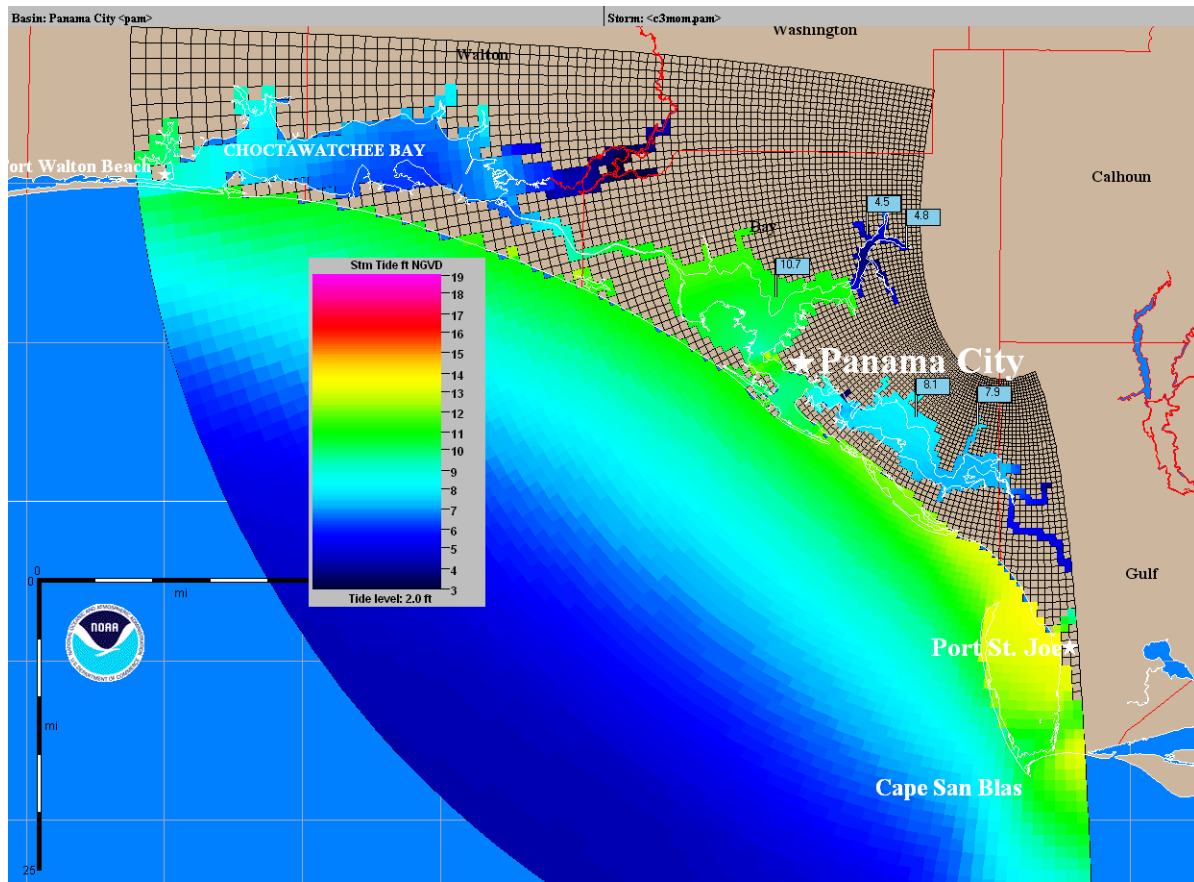
1.1 Apalachee Bay

Apalachee Bay is particularly prone to exceptionally large storm surges. Since reliable data has been maintained in the 1830s, our region of coastline has only experienced 9 major hurricanes. All 9 of these hurricanes were of category three intensity. Our worst case scenario would be a strong category two or three hurricane moving northward and striking along the Franklin County coastline between Apalachicola and Carrabelle. The category three scenario illustrated below would likely produce 15 to 20 feet of storm surge along Apalachee Bay. A storm surge of this height would likely destroy coastal communities as well as cut off portions of Franklin County from the remainder of the panhandle, thereby prolonging the recovery period. It should be noted that a major hurricane need not strike along the Franklin County coastline to produce a significant storm surge in Apalachee Bay. Hurricane Dennis in 2005, created a moderate storm surge across the bay even though it made landfall in the Pensacola area. Though the tropical storm force winds east of the center of Dennis produced the majority of the overall surge, a trapped continental shelf wave added around 2 to 4 feet, bringing the cumulative surge to 8 to 10 feet.



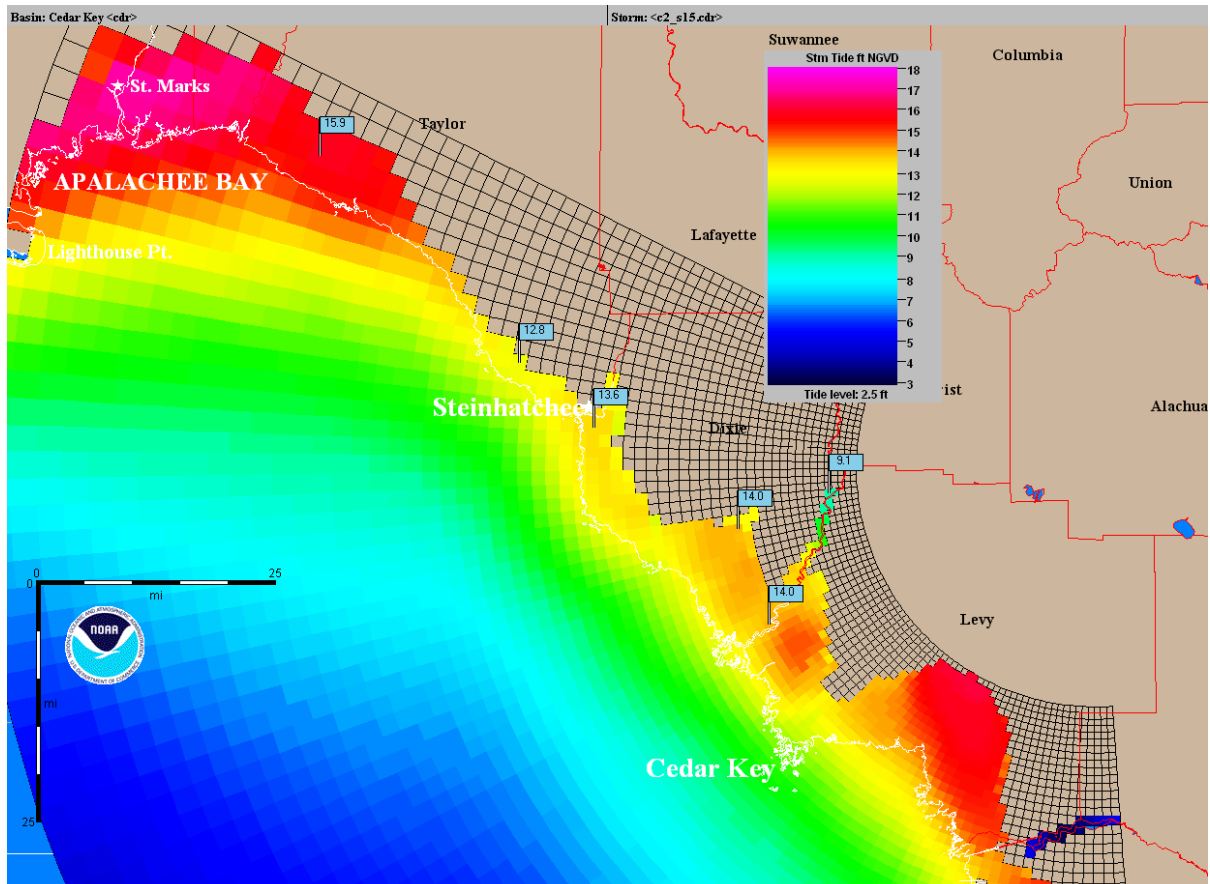
1.2 Florida Panhandle

Areas west of Apalachicola are less vulnerable than Apalachee Bay. Nevertheless, a major hurricane of category three intensity can still deliver significant surges to areas right along the immediate coast. The numerous inlets and bayous in Bay County afford another challenge as some locations well inland from the immediate coast could suffer from storm surge flooding under the right conditions. The category three maximum of maximum on the next page indicates that areas immediately located along these inlets and bayous could be flooded.



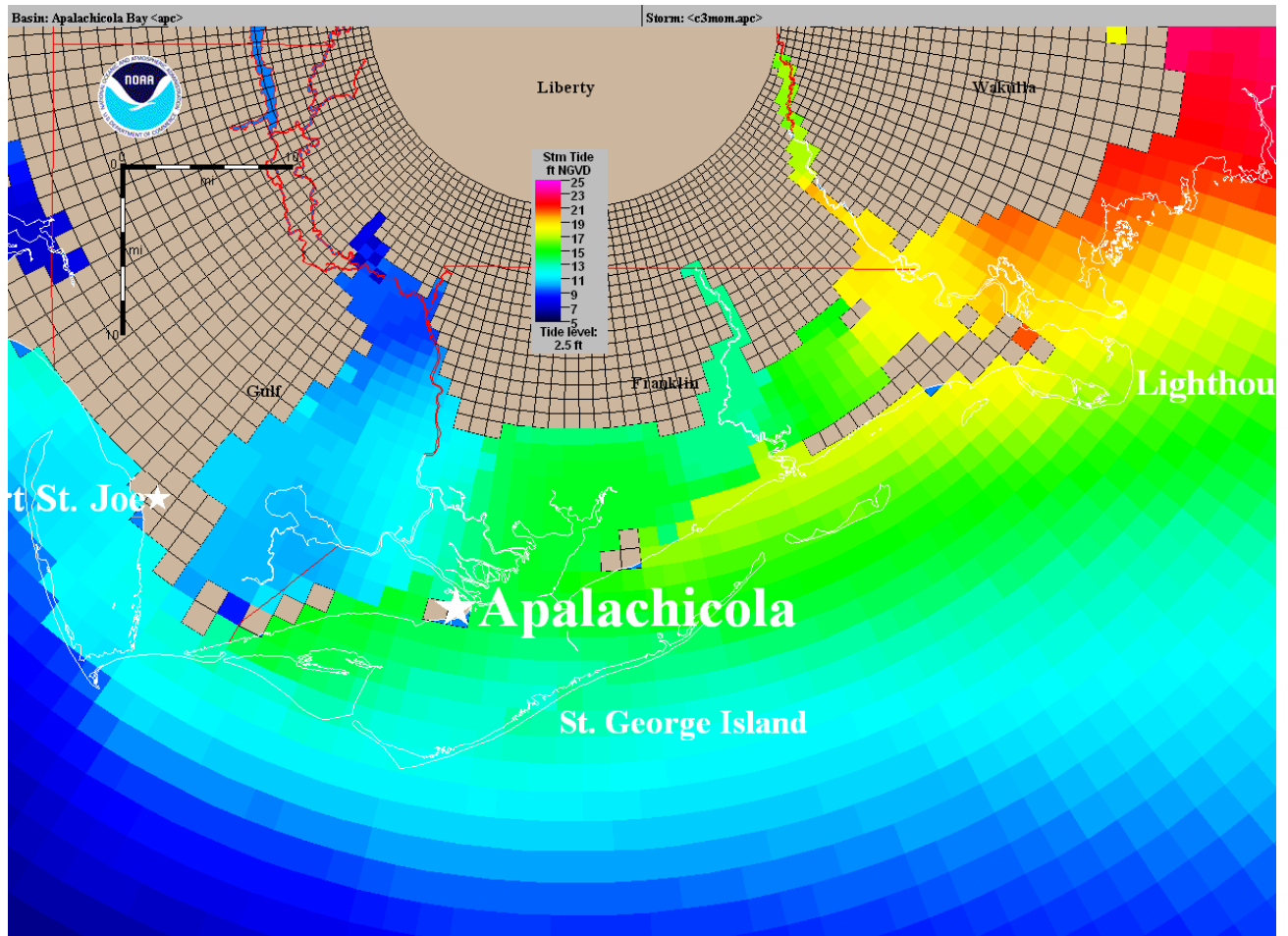
1.3 Eastern Florida Big Bend

Areas along the eastern portion of Apalachee Bay from Jefferson County to Dixie County can also experience significant storm surges that may extend inland for several miles under the right conditions. The maximum of maximum below of a category two hurricane indicates how significant this surge could be. Of particular concern would be the river flooding that would be produced in the Suwannee River Basin. The combination of heavy rainfall and storm surge travelling upstream from the mouth of the Suwannee could create dangerous flooding along the southern portion of the river.



1.4 Apalachicola

A category three storm surge as shown below for Franklin County could be particularly devastating as Saint George Island would likely be over washed in places, along with much of mainland Franklin County being inundated by a high storm surge nearing 17 feet in some places. This image is computed as a “worst case scenario” as it depicts the maximum value for all model runs using a category three hurricane.

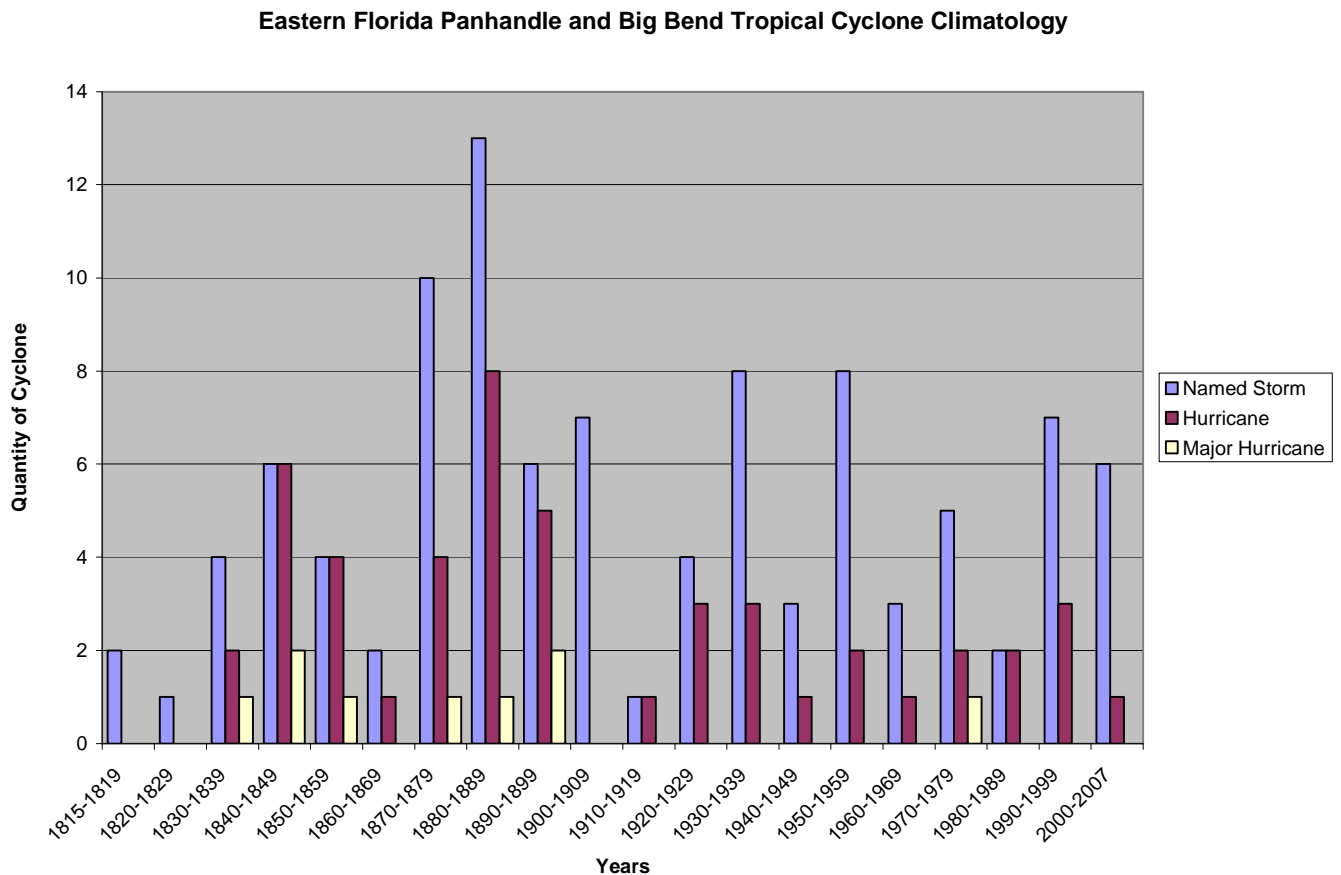


2. Historical Tropical Cyclone Data of the Florida Big Bend and Panhandle

2.1 Summary

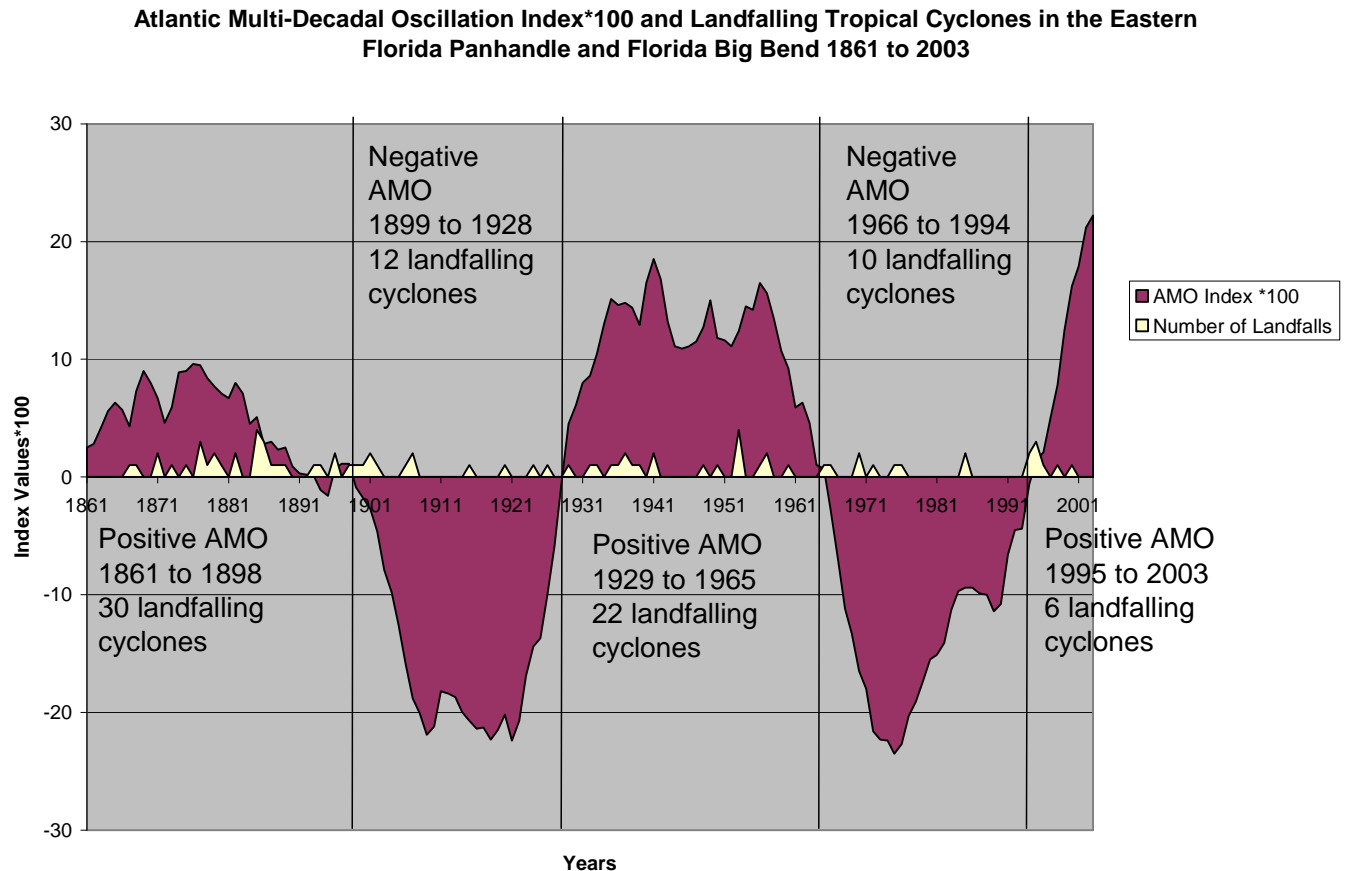
Reliable hurricane history for the region begins around 1815, though some storms through the 1820s may have been missed due to the region being sparsely populated until after Tallahassee became the territorial capital of the US Territory of Florida.

Over the period of 1815 to 2007, 102 systems of tropical storm intensity or higher have made landfall or moved near the region between Destin and the mouth of the Suwannee River. Several active periods are noted as indicated in the graph below.



During the most active period of 1870 to 1899, 29 tropical systems impacted the region, of which 17 were hurricanes. During this 30 year period, 45 percent of the region's major hurricane landfalls occurred. A relative quiet period ensued from 1900 through 1960 with only 34 tropical systems making landfall, of which only 11 were hurricanes. Our last major hurricane was Hurricane Eloise in 1975. Since 1980, 15 named storms have made landfall along our coastline. The reason for the noticeable decrease in landfalling tropical cyclones in the 20th century is unclear. However, we do know that climatology favors a tropical cyclone that is recurving into the westerlies as it approaches our forecast area. Tropical cyclones of this type are typically weakening around landfall. Historically, our coastline features one of the lowest probabilities of landfalls from a tropical system in the southeast.

One interesting way to look at tropical cyclone data for our region is to overlay the phase of the Atlantic Multi-Decadal Oscillation and the quantity of landfalling tropical cyclones.



As you would expect, when the AMO is positive, the number of landfalling tropical systems increase in our region. The most active period of record was from 1870 to 1900. One major hurricane did make landfall during a negative phase of the AMO. As has been widely disseminated since 1995, the Atlantic Basin has entered a period of increased tropical cyclone activity due to the AMO phase becoming positive. As this period continues, the likelihood of a tropical cyclone landfall across our coastline is increasing.

2.2 Specific Tropical Cyclones of Note:

August 7, 1837. A hurricane makes landfall along the northern Gulf Coast, likely somewhere west of Panama City. This storm produced a storm surge in excess of 6 feet at St. Marks. The effects of this storm at Saint Marks were likely similar to Hurricane Dennis of 2005.

August 30, 1837. A compact major hurricane makes landfall near Apalachicola. According to Florida's Hurricane History by Jay Barnes, "Damage from this hurricane was severe, as ships were wrecked and homes and wharves were washed away. In St. Joseph (near modern day Port St. Joe) a three story building was 'razed to the ground.' The damages in Apalachicola were first estimated to be \$200,000, but that figure was later reduced. The editor of the Apalachicola Gazette summaries the scene: 'I write from the midst of ruins.'"

September 1841. St. Joseph was completely destroyed by a hurricane. Little is known about this storm other than little was left of the town after the storm.

October 4, 1842. A major hurricane makes landfall near Saint Marks and produces a 20 foot storm surge at Cedar Key. Tallahassee suffers significant wind damage valued at 11.1 million in 2008 dollars. At Apalachicola, the East Pass lighthouse was heavily damaged when it lost 30 feet of its height. According to Florida's Hurricane History, "roads in all directions from the Florida capital were blocked with thousands of fallen trees."

September 13, 1843. Port Leon is wiped off the map by a category two hurricane. A 10 foot storm surge is produced referred to as a "tidal wave". The hurricane kills 14 in the Florida Panhandle. In the Florida Historical Quarterly, historian T. Frederick Davis wrote:

Every warehouse in the town was laid flat with the ground....Nearly every dwelling was thrown from its foundation and many of them crushed to atoms. The merchants took what precautions they could for protection against high wind and water before the height of the storm, by moving their goods, as they thought, out of danger. But the surging water and furious blasts were irresistible, and the goods in the stores were either destroyed or badly damaged....Every dwelling house and store that was not demolished was left in a wretchedly shattered and filthy condition.

August 30, 1850. A powerful hurricane hits Apalachicola bringing a significant storm tide. Several downtown streets were flooded.

August 24, 1851. The Great Middle-Florida Hurricane. A major hurricane hits Apalachicola producing a 12 foot storm surge in Saint Marks. This storm was recorded as the "most savage and destructive storm in the history of Apalachicola." The Commercial Advertiser, the newspaper in Apalachicola reported that this was, "the most destructive storm it has ever witnessed." All three lighthouses were blown down or washed away. Florida's Hurricane History puts it this way:

"The wind apparently blew for more than twenty hours, leveling houses of all sizes. Extremely high tides washed away warehouses and stores and all of their contents, leaving the inhabitants without shelter and almost without food. All of the buildings on Water Street were destroyed, and every house on Front or Commerce Street is in ruins."

In Tallahassee, the Tallahassee Sentinel reported that "tall forest oaks were uprooted or rudely snapped asunder; China trees stood no chance, fences were prostrated, tin roofing peeled up like paper, roofs torn up, brick bats flying; and altogether such a general scatteration taking place as is not often seen."

At Saint Marks, the storm tide was greater than all previous storms with portions of the fortifications swept away. The tide was estimated in excess of 12 feet. Residents were forced from their homes in the midst of the storm and forced to swim or float on debris.

October 3, 1877. A major hurricane makes landfall at Apalachicola creating a storm surge of 12 feet.

June 21, 1886. A category 2 hurricane makes landfall in Saint Marks.

June 30, 1886. A category 2 hurricane makes landfall east of Apalachicola.

June 9, 1966. Hurricane Alma makes landfall near Apalachicola as a category two hurricane. Alma caused 66 million dollars (2008 USD) in damage. Winds of 75 to 100 mph were estimated in coastal Wakulla County.

September 23, 1975. Major Hurricane Eloise makes landfall near Destin with winds of 125 mph. This storm created a 16 foot storm surge across the Panhandle Coast. Damage exceeded 400 million in 2008 USD.

November 21, 1985. Hurricane Kate makes landfall east of Panama City, near Mexico Beach with winds of 95 mph. Significant wind damage occurred around the western Florida Big Bend, particularly in and around Tallahassee.

Even if a tropical cyclone does not directly make landfall in our forecast area, impacts can still be felt. This was very much the case in the active 2004 season. Bonnie, Frances, Ivan, and Jeanne all had an impact on our forecast area. The most severe was Ivan which produced numerous tornadoes across the forecast area and storm surge heights of 8 to 10 feet along the panhandle coast.

The 2005 hurricane season continued to bring a series of tropical cyclones into the Gulf of Mexico. Hurricane Dennis, even though making landfall in the Pensacola area, provided moderate to significant damage along our coastline. While wind speeds remained below hurricane force across our forecast area, the main story was storm surge. Between 8 to 10 feet of storm surge was observed in Apalachee Bay well east of where Dennis made landfall. From Apalachicola to Keaton Beach, coastal communities were inundated with storm surge. US Highway 98 was washed out in several places in Franklin County. The worst damage was in the community of Saint Marks where a large portion of the town was under 4 to 6 feet of water. The unusually high storm surge from a storm making landfall a couple hundred miles to the west was caused by a trapped continental shelf wave moving northward along the Florida west coast.

3. P-3 Orion Hurricane Hunter Plane



Specially equipped NOAA aircraft play an integral role in hurricane forecasting. Data collected during hurricanes by these high-flying meteorological stations and from a variety of other sources are fed into numerical computer models to help forecasters predict how intense a hurricane will be, and when and where it will make landfall. These computer models fulfill two important purposes: to help forecasters make accurate predictions during a hurricane; and to help hurricane researchers achieve a better understanding of storm processes, thereby improving their forecast models.

Slicing through the eyewall of a hurricane, buffeted by howling winds, blinding rain, hail, and violent updrafts and downdrafts before entering the relative calm of the storm's eye, NOAA's two P-3 turboprop aircraft probe every wind and pressure change, repeating the grueling experience again and again during the course of a ten-hour mission.

Scientists aboard the aircraft deploy instruments called GPS (Global Positioning System) dropwindsondes as the P-3 flies through the hurricane. These devices continuously radio back measurements of pressure, humidity, temperature, and wind direction and speed as they fall toward the sea, providing a detailed look at the structure of the storm and its intensity.

For years NOAA pilots have flown P-3s into hurricanes at low altitudes (1,500-10,000 ft.) to collect research-mission data critical for computer models that predict hurricane intensity and landfall. This information is used differently than the hurricane reconnaissance information provided to the National Hurricane Center by U.S. Air Force Reserves WC-130s. Information from both types of flights, however, directly contributes to the safety of Americans living along the vulnerable Atlantic and Gulf coasts.

In addition to flying hurricane research and reconnaissance missions, NOAA's P-3s participate in a wide variety of national and international meteorological and oceanographic research programs each year. Recently, these aircraft have been used in major studies on storms approaching the continents of Europe and North America to improve forecasts and study the effects of El Niño; atmospheric gases and aerosols over the North Atlantic; large-scale convective storm complexes in the Midwest, and winter storms battering U.S. Pacific coastal states.